

TESTING OF NUCLEAR DATA FOR IRON, CHROMIUM AND NICKEL THROUGH A WIDE SET OF INTEGRAL EXPERIMENTS

Vladimir N. Koshcheev, Mark N. Nikolaev, Gennadi N. Manturov, Michael Y. Semenov, Anatoly M. Tsiboulya

Institute of Physics and Power Engineering (IPPE)

A set of experiments on BFS critical facility with different kinds of reflector filled by stainless steel and pure structure materials was fulfilled to study Fe, Cr and Ni neutron cross-sections in the fast energy region.

Measured traverses of uranium and plutonium fission reaction rates within the core and the reflector region were compared to the calculation results obtained by using different evaluations for Fe, Cr and Ni neutron cross-sections from BROND-2, FOND-2.2, ENDF/B-6, JENDL-3.2 and JENDL-3.3, JEF-2.2.

Additionally other types of experiments being performed in the past were involved to the analysis of Fe, Cr and Ni neutron cross-sections:

A. Integral experiments in well-known neutron spectra:

- Transmission measurements with ^{252}Cf fission source in spherical geometry,
- Flat transmission measurements in so called “good” geometry.

B. Reactor physics experiments:

- Criticality and reactivity measurements in KBR critical assemblies in the media with k-infinite close to 1,
- Measurements of fission rate distribution in series of MASURKA, ZPR-3 and BFS-62 experiments with stainless steel reflector.

The comprehensive comparison of the analysis results and the observed discrepancies are discussed.